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Development of Flood Hazard Map from Probabilistic Embankment Collapse Inflow

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Flood damages caused by abnormal climate changes occur frequently every year. Systems to predict and respond to disasters are required to prepare for flood damages. The embankment overflow and collapse mechanism due to the rapid increase of river water level in flood are quite complex, varied, and uncertain. In this study, changes of river embankment collapse widths and flood inflows were calculated. In this case, the MCS-based probability flood levels were used based on the hydrological scenario, which takes into account the uncertainty of the parameters of extreme precipitation through the abnormal frequency analysis. In addition, two-dimensional inundation analysis was performed to estimate flood depth and flood area, and to produce a probabilistic flood hazard map. By quantitatively evaluating the uncertainty of the parameters in consideration of the overall mechanism of flood occurrence, we obtained more reliable predictions of flood depth than conventional deterministic analyses.